54Mbps PoE Access Point

WAP-4033PE

User's Manual

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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio technician for help.

FCC Caution

To assure continued compliance. (example-use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the Following two conditions: (1) This device may not cause harmful interference, and (2) this Device must accept any

interference received, including interference that may cause undesired operation.

Federal Communication Commission (FCC) Radiation Exposure Statement

This equipment complies with FCC radiation exposure set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20 cm (8 inches) during normal operation.

R&TTE Compliance Statement

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal Equipment and the mutual recognition of their conformity (R&TTE)

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) As of April 8,2000.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries Not Intended for Use

The ETSI version of this device is intended for home and office use in Austria Belgium, Denmark, Finland, France (with Frequency channel restrictions). Germany, Greece, Ireland, Italy, Luxembourg .The Netherlands, Portugal, Spain, Sweden and United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states Iceland, Liechtenstein, Norway and Switzerland.

Potential restrictive use

France: Only channels 10,11,12 and 13

WEEE regulation

To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

User's Manual for PLANET 54Mbps PoE Access Point

Model: WAP-4033PE

Rev: 1.0 (Oct, 2006)

Part No. EM-WAP4033PE

TABLE OF CONTENTS

Chapter 1 Introduction 7

1.1 Package Contents 7

1.2 System Requirements 7

1.3 Features 8

1.4 LED Indicators 8

1.5 Wireless Performance 8

1.6 Reset Button 9

Chapter 2 Hardware Installation 10

Chapter 3 Web Configuration 11

3.1 Home 11

3.2 Basic Setting 12

3.2.1 AP Mode 12

3.2.2 Station - Ad Hoc Mode 14

3.2.3 Station - Infrastructure Mode 16

3.2.4 AP Bridge - Point to Point Mode 17

3.2.5 AP Bridge - Point to Multipoint Mode 18

3.2.6 AP Bridge - WDS Mode 19

3.2.7 Universal Repeater Mode 21

3.2.8 Security setting of bridge mode 22

3.3 Advanced Settings 24

3.4 Security 25

3.4.1 802.1x 26

3.4.2 WEP 27

3.4.3 WPA pre-shared key 28

3.4.4 WPA RADIUS 30

3.5 MAC Filtering 31

3.6 System Utility 32

3.7 Configuration Utility 33

3.8 Upgrade 34

3.9 Reset 35

Chapter 4 Specification 36

Chapter 5 Frequently Ask Question 37

Chapter 1 Introduction

Thank you for purchasing WAP-4033PE. The WAP-4033PE supports both IEEE 802.11b and IEEE 802.11g standards. You can use it to connect an existing WLAN, or to build up a new wireless LAN. Except for essential AP mode, WAP-4033PE also provides AP Client/ Bridge/ Repeater and WDS (Wireless Distributed System) modes to accommodate all kinds of network topology. High data rate (up to 54Mbps) support allows faster communication between LAN and WLAN. Maximize network efficiency while minimizing your network investment and maintenance costs. With the PoE (IEEE802.3af) interface, users can easily connect this AP to anywhere.

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Supports WPA, WPA2, WEP and MAC address filter function to consolidate the wireless network security, you can prevent unauthorized wireless stations from accessing your wireless network.

This product provides a friendly user interface and allows users to configuring from web browser. Without utility install, user doesn't need to find the utility for this product in lots of program list, it can be configured in different OS that has provide web browser.

1.1 Package Contents

Make sure that you have the following items:

- 1 x WAP-4033PE
- 1 x Power Adapter
- 1 x User's Manual CD
- 1 x Quick Installation Guide
- 1 x External Antenna

Note:	If any of the above items are missing, contact your supplier as soon as possible.

1.2 System Requirements

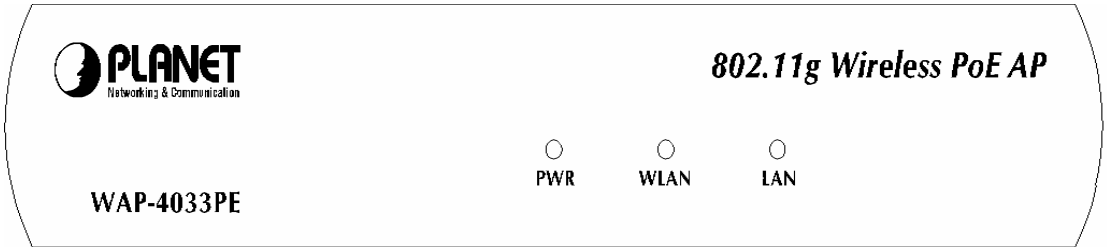
Before installation, please check the following requirements with your equipment.

- Pentium Based (or above) IBM-Compatible PC System
- CD-ROM drive
- Windows 98/Me/NT/2000/XP/Server2003 Operating System with TCP/IP protocol

1.3 Features

- Complies with the IEEE 802.11b/g (DSSS) 2.4GHz specification
- Supports 2.400~2.4835 GHz frequency band
- Data rate supports up to 54Mbps
- IEEE 802.3af compliant
- Auto rate fallback in case of obstacles or interferences
- Supports WEP/WPA-PSK/WPA/WPA2 encryption
- Supports AP/ AP Client/ Bridge/ Repeater and WDS (Wireless Distributed System) mode
- Seamlessly integrate wireless and wired Ethernet LAN networks
- Provides MAC Filter function
- Built-in DHCP server
- Support Auto-MDI/MDI-X
- Web-based configuration

1.4 LED Indicators



LED	Color	Function
PWR	Green	Off: Power is not connected On: Device is ready Blink: During boot up procedure
WLAN	Green	Off: Wireless LAN is no function Blink: Transmitting or receiving data through the Wireless LAN
LAN	Green	Off: LAN is not connected On: LAN is connected Blink: Transmitting or receiving data through the LAN

1.5 Wireless Performance

The following information will help you utilizing the wireless performance and operating coverage of WAP-4033PE.

1. Site selection

To avoid interferences, please locate WAP-4033PE and wireless client away from transformers,

microwave ovens, heavy-duty motors, fluorescent lights and other industrial equipments. Keep the number of walls or ceilings between AP and clients as few as possible. Otherwise the signal strength may be seriously reduced. Place WAP-4033PE in a open space or add additional WAP-4033PE as needed to improve the coverage.

2. **Environmental factors**

   The wireless network is easily affected by many environment factors. Every environment is unique with different obstacles, construction materials, weather, etc. It is hard to determine the exact operation rage of WAP-4033PE in a specific location without testing.

3. **Antenna adjustment**

   The bundle antenna of WAP-4033PE is adjustable. Firstly install the antenna pointing straight up, then smoothly adjust it if the radio signal strength is poor. But the signal reception is definitely weak in some certain areas, such as location right down the antenna.

   Moreover, the original antenna of WAP-4033PE can be replaced with other external antennas to extend the coverage. Please check the specification of the antenna you want to use, and make sure it can be used on WAP-4033PE.

4. **WLAN Type**

   If WAP-4033PE is installed in an 802.11b and 802.11g mixed WLAN, its performance will reduced significantly. Because every 802.11g OFDM packet needs to be preceded by an RTS-CTS or CTS packet exchange that can be recognized by legacy 802.11b devices. This additional overhead lowers the speed. If there are no 802.11b devices connected, or if connections to all 802.11b devices are denied so that WAP-4033PE can operate in 11g-only mode, then its data rate should actually 54Mbps.

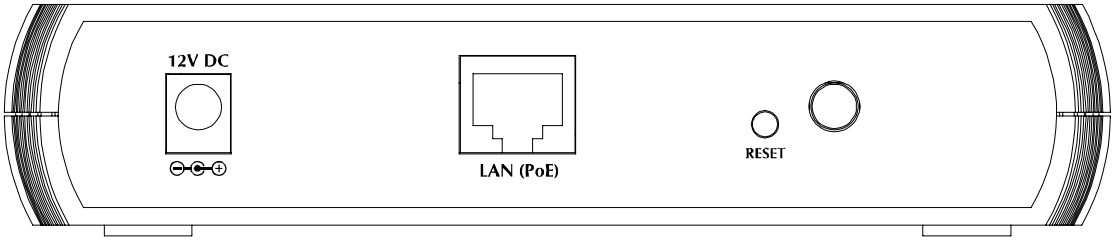
1.6 Reset Button

WAP-4033PE provides a Reset button on the rear panel for user to reset or set WAP-4033PE configuration to factory default by hardware.

Time	Active
Press less than 5 Sec.	WAP-4033PE will re-boot itself, keeping your original configurations
Press more than 5 Sec.	WAP-4033PE will reset itself to the factory default settings

Chapter 2 Hardware Installation

Before you proceed with the installation, it is necessary that you have enough information about the WAP-4033PE.



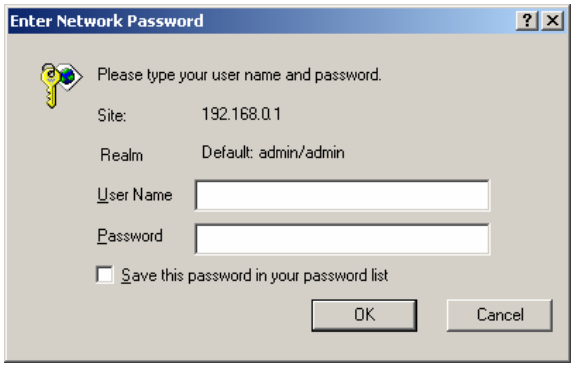
1. **Locate an optimum location for the WAP-4033PE.** The best place for your WAP-4033PE is usually at the center of your wireless network, with line of sight to all of your mobile stations.
2. **Assemble the antenna to WAP-4033PE.** Try to place them to a position that can best cover your wireless network. The antenna's position will enhance the receiving sensitivity.
3. **Connect RJ-45 cable to WAP-4033PE.** Connect this WAP-4033PE to your LAN switch/hub or a single PC. If the connected device is IEEE802.3af compliant switch, the WAP-4033PE will power on. You will not need to plug-in the power adapter in next step.
4. **Plug in power adapter and connect to power source**. After power on, WAP-4033PE will start to work.

Note:	ONLY use the power adapter supplied with the WAP-4033PE. Otherwise, the product may be damaged. If you want to reset your WAP-4033PE to default settings, press the Reset button 5 second. Then release the button and wait for 10 seconds for rebooting.

Chapter 3 Web Configuration

Web configuration provides a user-friendly graphical user interface (web pages) to manage your WAP-4033PE. An AP with an assigned IP address (e.g. http://192.168.0.1) will allow you to monitor and configure (via web browser e.g., MS Internet Explorer or Netscape).

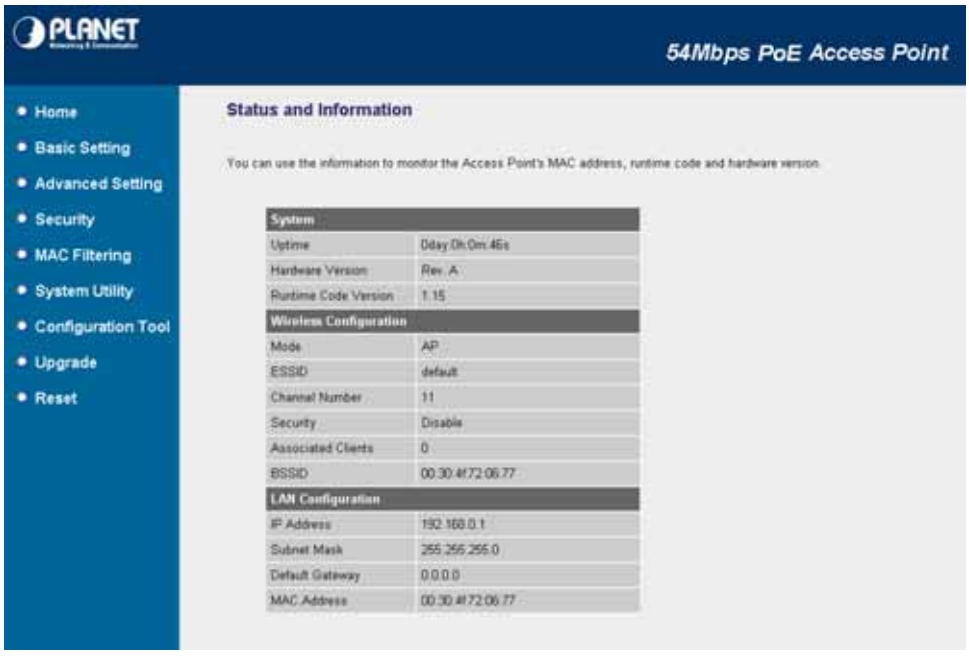
1. Open your web browser.
2. Enter WAP-4033PE IP address (default IP address is http://192.168.0.1) into the address field of the web browser. Please also make sure your PC's IP address is in the same IP range with WAP-4033PE.
3. A User Name and Password dialog box will appear. Please enter your User Name and Password here. Default User Name and Password are "admin". Click "OK".



4. When enter correct User Name and Password, you will see the configuration screen as section 3.1.

3.1 Home

In this screen, you can check all the information of WAP-4033PE.

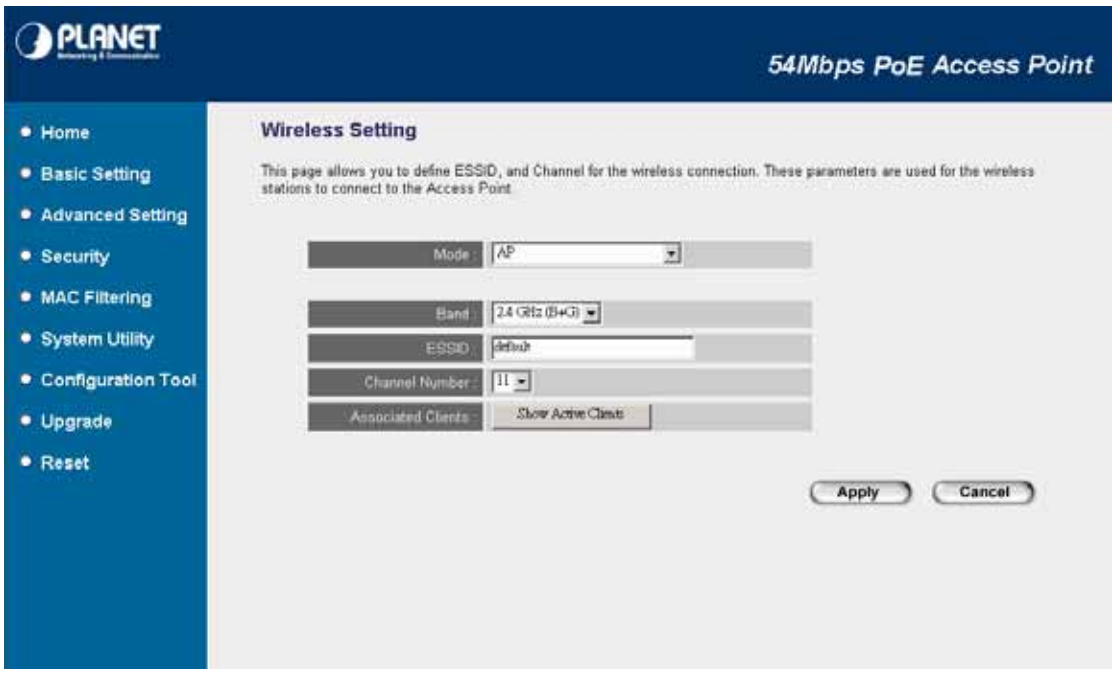


3.2 Basic Setting

In this option, you can configure WAP-4033PE to work to different operating mode. Please refer to below sections to know the details configuration of each operating mode.

3.2.1 AP Mode

This mode is set to WAP-4033PE by default. It served as a transparent Media Access Control (MAC) bridge between wired and wireless network.



Parameter	Description
Mode	Shows the current operation mode. You may set WAP-4033PE to other operating mode by select other operating mode.
Band	**2.4GHz (B):** It allows to select the transmit rate up to 11Mbps. **2.4GHz (G):** It allows to select the transmit rate up to 54Mbps. **2.4GHz (B+G):** It provides best performance for 11g transmission when you enable the AP mode selection to “Mixed mode”.
SSID	The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. Please make sure that the SSID of all stations in the same WLAN network are the same. The default SSID is “**default**”.
Channel Number	Select the appropriate channel from the list provided to correspond with your network settings. Channels differ from country to country. Channel 1-11 (North America) Channel 1-14 (Japan) Channel 1-13 (Europe)
Associated Clients	You may press “**Show Active Clients**” button to check the connected client information. After the button pressed, you will see the dialog box as below.

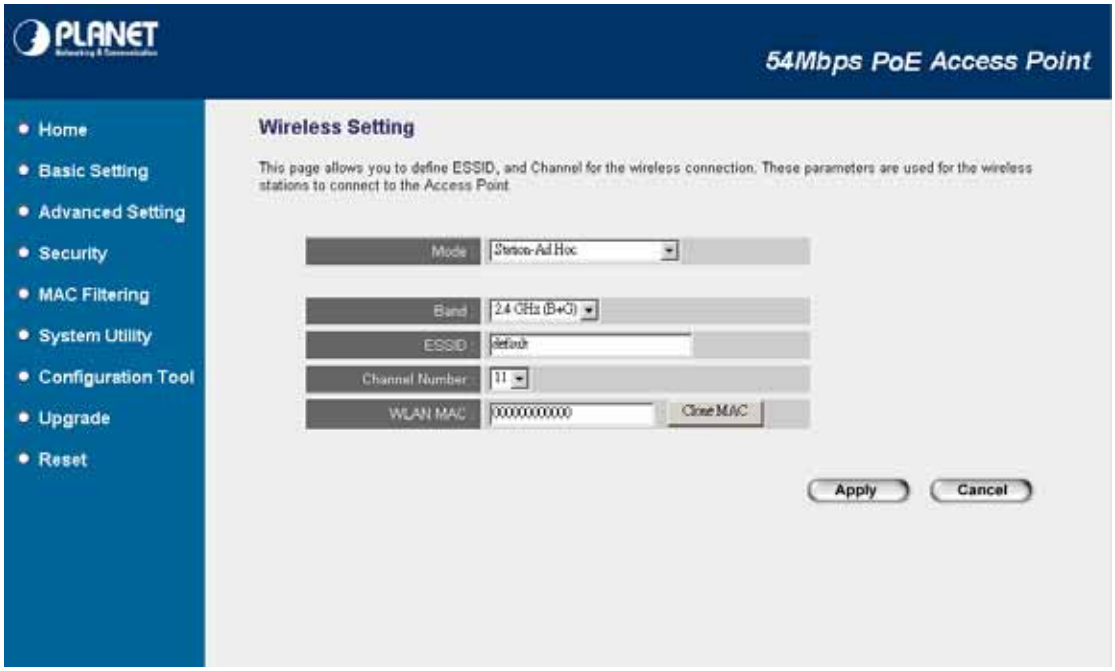
You may press “**Refresh**” to get the new client table or “**Close**” to close this dialog box.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration. This screen will appear after press the “Apply” button in each configuration screen. When you complete all the configuration of WAP-4033PE, please press “Apply” of this screen to make the new settings

work. You may check the LED status to make sure WAP-4033PE is finish the restart.

3.2.2 Station - Ad Hoc Mode

Served as a wireless station (Ad-hoc). Connected to a PC or a small LAN, this station along with other wireless stations can establish a small wireless network without Access Points.

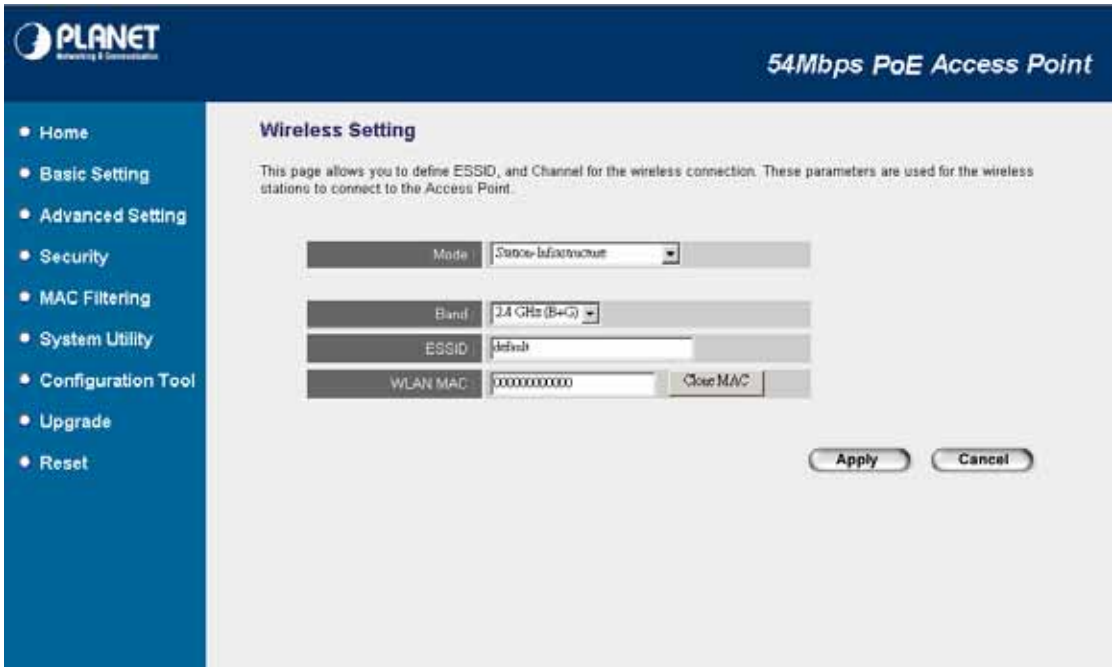


Parameter	Description
Mode	Shows the current operation mode. You may set WAP-4033PE to other operating mode by select other operating mode.
Band	**2.4GHz (B):** It allows to select the transmit rate up to 11Mbps. **2.4GHz (G):** It allows to select the transmit rate up to 54Mbps. **2.4GHz (B+G):** It provides best performance for 11g transmission when you enable the AP mode selection to “Mixed mode”.
SSID	Please make sure the SSID of the wireless network that you will connected and enter the correct SSID in this field. The default SSID is “**default**”.
Channel Number	Select the appropriate channel from the list provided to correspond with your network settings. Channels differ from country to country. Channel 1-11 (North America) Channel 1-14 (Japan) Channel 1-13 (Europe)
WLAN MAC	**Keep default setting**: WAP-4033PE will use it’s own MAC address to access the wireless LAN. **Press “MAC Clone” button**: It will use PC’s MAC address to access the wireless LAN.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.2.3 Station - Infrastructure Mode

Served as a wireless station (infrastructure). Connected to a PC or a small LAN, it allows the PC or small LAN able to access the wireless network via Access Point.

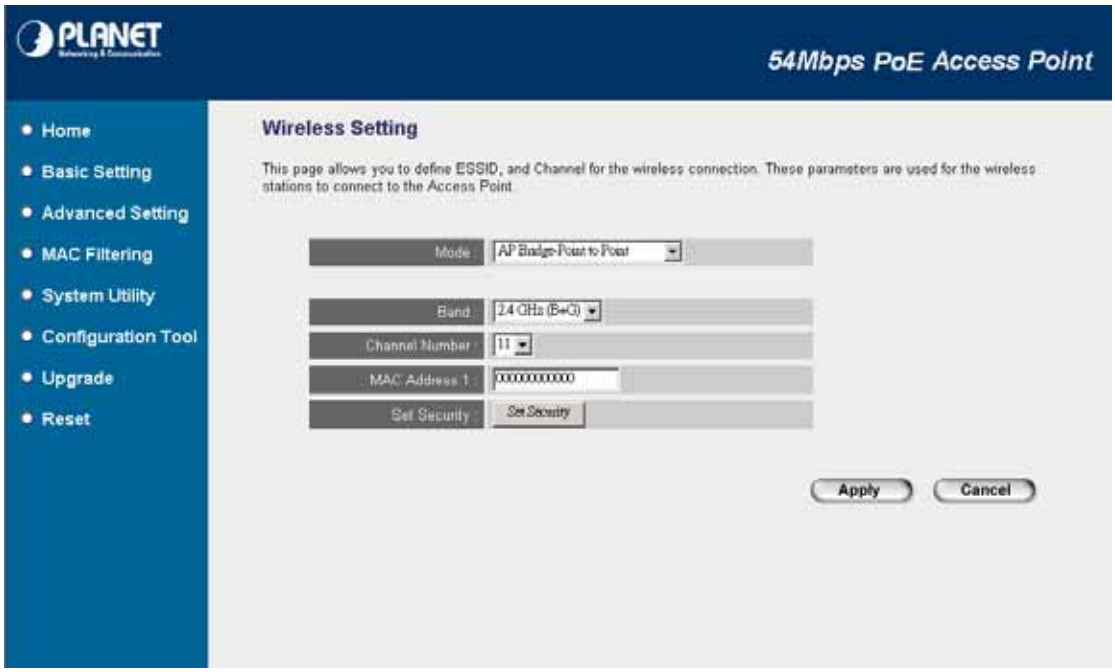


Parameter	Description
Mode	Shows the current operation mode. You may set WAP-4033PE to other operating mode by select other operating mode.
Band	**2.4GHz (B):** It allows to select the transmit rate up to 11Mbps. **2.4GHz (G):** It allows to select the transmit rate up to 54Mbps. **2.4GHz (B+G):** It provides best performance for 11g transmission when you enable the AP mode selection to “Mixed mode”.
SSID	Please make sure the SSID of the wireless network that you will connected and enter the correct SSID in this field. The default SSID is “**default**”.
WLAN MAC	**Keep default setting**: WAP-4033PE will use it’s own MAC address to access the wireless LAN. **Press “MAC Clone” button**: It will use PC’s MAC address to access the wireless LAN.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.2.4 AP Bridge - Point to Point Mode

This function provides to bridge for 2 wired Ethernet networks to connect to each other by wireless. You can use two WAP-4030s in this mode to connect two wired Ethernet networks together.



Parameter	Description
Mode	Shows the current operation mode. You may set WAP-4033PE to other operating mode by select other operating mode.
Band	**2.4GHz (B):** It allows to select the transmit rate up to 11Mbps. **2.4GHz (G):** It allows to select the transmit rate up to 54Mbps. **2.4GHz (B+G):** It provides best performance for 11g transmission when you enable the AP mode selection to “Mixed mode”.
Channel Number	Select the appropriate channel from the list provided to correspond with your network settings. Channels differ from country to country. Channel 1-11 (North America) Channel 1-14 (Japan) Channel 1-13 (Europe)
MAC Address 1	**Keep default setting**: WAP-4033PE will use it’s own MAC address to access the wireless LAN. **Press “MAC Clone” button**: It will use PC’s MAC address to access the wireless LAN.
Set Security	IF you want to enable security to protect your wireless connection. Please press “Set Security” button and refer to section “3.2.8 Security setting for bridge mode”

to configure the detail settings.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.2.5 AP Bridge - Point to Multipoint Mode

This function provides to bridge more than 2 wired Ethernet networks together by wireless connection. You can use more than two WAP-4033PE with this mode to connect those wired Ethernet networks together.

Parameter	Description
Mode	Shows the current operation mode. You may set WAP-4033PE to other operating mode by select other operating mode.
Band	**2.4GHz (B):** It allows to select the transmit rate up to 11Mbps. **2.4GHz (G):** It allows to select the transmit rate up to 54Mbps. **2.4GHz (B+G):** It provides best performance for 11g transmission when you enable the AP mode selection to “Mixed mode”.
Channel Number	Select the appropriate channel from the list provided to correspond with your network settings. Channels differ from country to country. Channel 1-11 (North America) Channel 1-14 (Japan) Channel 1-13 (Europe)

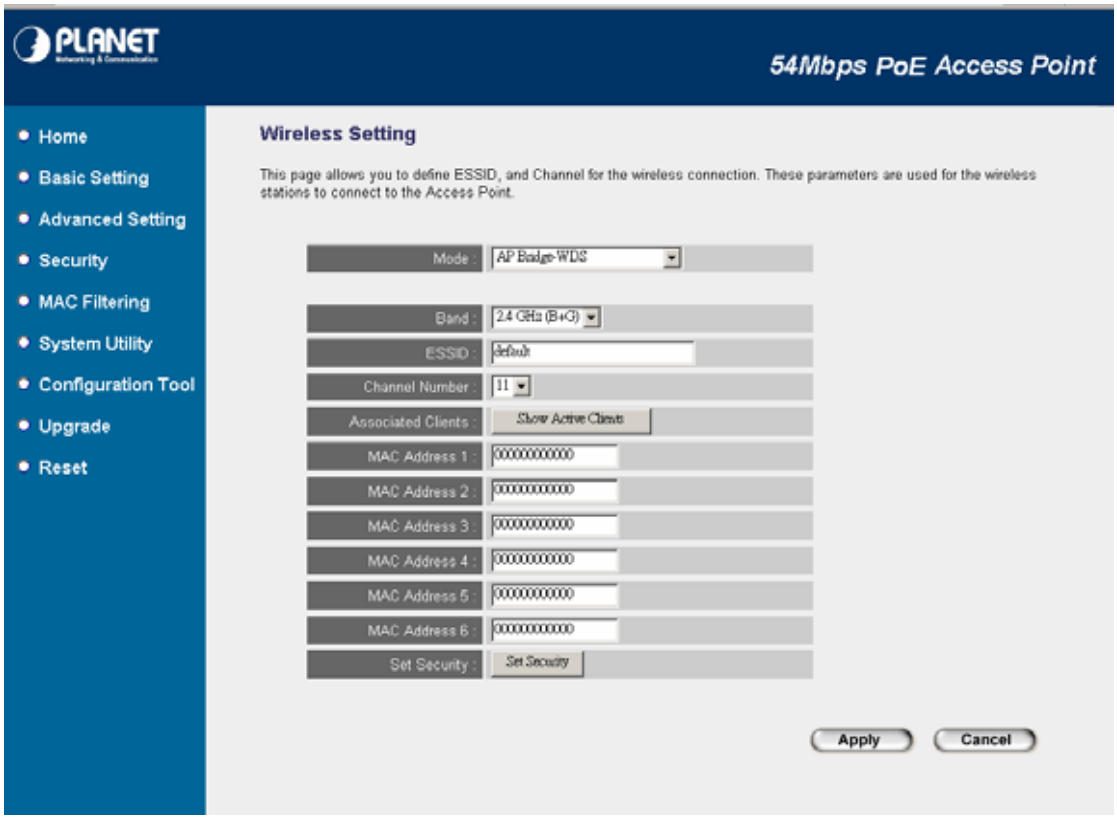
AP MAC Address — If you want to bridge more than two wired Ethernet networks together with wireless connection, you have to enter the MAC addresses of otherWAP-4033PEs that with join the bridging work into the fields.

Set Security — IF you want to enable security to protect your wireless connection. Please press “Set Security” button and refer to section “3.2.8 Security setting for bridge mode” to configure the detail settings.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.2.6 AP Bridge - WDS Mode

If you want an access point to bridge wired Ethernet network and provide connection service for other wireless bridge at the same time, you have to set the WAP-4033PE to “AP Bridge - WDS”. Simply speaking, “AP Bridge - WDS” function is the combination of “AP mode” and “AP Bridge-Point to Multi-Point mode”.



Parameter	Description
Mode	Shows the current operation mode. You may set WAP-4033PE to other operating mode by select other operating mode.

Band **2.4GHz (B):** It allows to select the transmit rate up to 11Mbps.

2.4GHz (G): It allows to select the transmit rate up to 54Mbps.

2.4GHz (B+G): It provides best performance for 11g transmission when you enable the AP mode selection to “Mixed mode”.

SSID The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. Please make sure that the SSID of all stations in the same WLAN network are the same. The default SSID is “**default**”.

Channel Number Select the appropriate channel from the list provided to correspond with your network settings. Channels differ from country to country.

Channel 1-11 (North America)

Channel 1-14 (Japan)

Channel 1-13 (Europe)

Associated Clients You may press “Show Active Clients” button to check the connected client information. After the button pressed, you will see the dialog box as below:

You may press “Refresh” to get the new client table or “Close” to close this dialog box.

MAC Address 1 ~6 If you want to bridge more than two wired Ethernet networks together with wireless connection, you have to enter the MAC addresses of otherWAP-4033PEs that with join the bridging work into the fields.

Set Security IF you want to enable security to protect your wireless connection. Please press “Set Security” button and refer to section “3.2.8 Security setting for bridge mode” to configure the detail settings.

After configuration complete, please click “Apply” button to save the configuration. Then you will

see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.2.7 Universal Repeater Mode

“Universal Repeater Mode” allows you to extend the range of your wireless network. When the AP is configured to repeater mode, it will repeat the wireless signal from wireless client to access point. Thus, the wireless connection distance can be extended. However, the performance will become half of normal performance when client connect to a Repeater. Besides, when the WAP-4033PE is configured to repeater mode, you can only manage the AP through LAN interface and the PC(s) connected to its LAN port cannot communicate with other wireless clients.

Parameter	Description
Mode	Shows the current operation mode. You may set WAP-4033PE to other operating mode by select other operating mode.
Band	**2.4GHz (B):** It allows to select the transmit rate up to 11Mbps. **2.4GHz (G):** It allows to select the transmit rate up to 54Mbps. **2.4GHz (B+G):** It provides best performance for 11g transmission when you enable the AP mode selection to “Mixed mode”.
SSID	The SSID (up to 32 printable ASCII characters) is the unique name identified in a WLAN. The ID prevents the unintentional merging of two co-located WLANs. Please make sure that the SSID of all stations in the same WLAN network are the

same. The default SSID is “**default**”.

Channel Number — Select the appropriate channel from the list provided to correspond with your network settings. Channels differ from country to country.

Channel 1-11 (North America)

Channel 1-14 (Japan)

Channel 1-13 (Europe)

Associated Clients — You may press “Show Active Clients” button to check the connected client information. After the button pressed, you will see the dialog box as below.

You may press “Refresh” to get the new client table or “Close” to close this dialog box.

WLAN MAC — **Keep default setting**: WAP-4033PE will use it’s own MAC address to access the wireless LAN.

Press “MAC Clone” button: It will use PC’s MAC address to access the wireless LAN.

Root AP SSID — In “Universal Repeater mode”, this device can act as a station to connect to a Root AP. You should assign the SSID of the Root AP here.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.2.8 Security setting of bridge mode

In “AP Bridge-Point to Point mode”, ““AP Bridge-Point to Multi-Point mode” and “AP Bridge-WDS mode”, you can click “Set Security” to add encryption for the communication between the bridged access points. This can protect your wireless network.

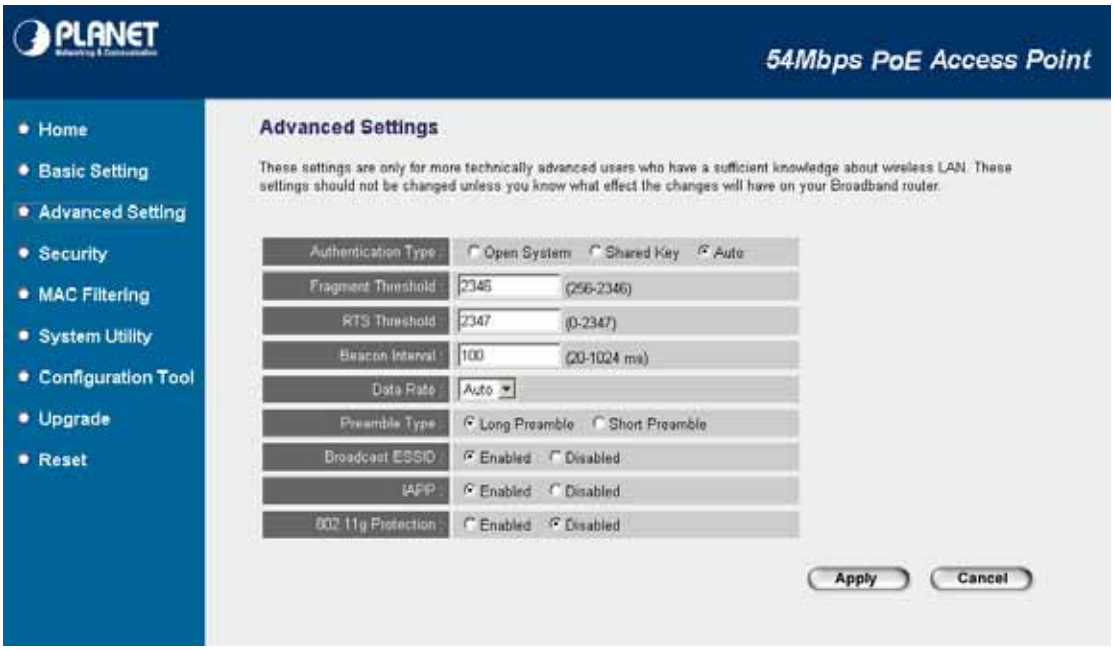
Parameter	Description
Encryption	You can select “None”, “WEP 64bits”, “WEP 128bits”, “WPA (TKIP)” or “WPA2 (AES)” of this option . In default, it is None.
Key Format	This is only used when you select “WEP 64bits” or “WEP 128bits” encryption method. You may select to select ASCII Characters (alphanumeric format) or Hexadecimal Digits (in the “A-F”, “a-f” and “0-9” range) to be the WEP Key. For example: ASCII Characters: guest Hexadecimal Digits: 12345abcde
WEP Key	This is only used when you select “WEP 64bits” or “WEP 128bits” encryption method. The WEP key is used to encrypt data transmitted between the bridged access points. Fill the text box by following the rules below. 64-bit WEP: input 10-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or 5-digit ASCII character as the encryption keys. 128-bit WEP: input 26-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or 10-digit ASCII characters as the encryption keys.
Pre-shared Key Format	You may select to select Passphrase (alphanumeric format) or Hexadecimal Digits (in the “A-F”, “a-f” and “0-9” range) to be the Pre-shared Key. For example: Passphrase: iamguest Hex (64 characters): 12345abcde
Pre-shared Key	The Pre-shared key is used to authenticate and encrypt data transmitted between

the bridged access points. Fill the text box by following the rules below. Hex (64 characters): input 64-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or at least 8 character pass phrase as the pre-shared keys.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.3 Advanced Settings

You can set advanced parameters of this access point. The parameters include Authentication Type, Fragment Threshold, RTS Threshold, Beacon Interval, Data Rate, Preamble Type, Broadcast ESSID, IAPP and 802.11g Protection. You should not change these parameters unless you know what effect the changes will have on this access point.



Parameter		Description
Authentication Type	Open System	Wireless stations can associate with this access point without WEP encryption.
	Shared Key:	You should also setup WEP key in the “Encryption” page and wireless stations should use WEP encryption in the authentication phase to associate with this access point.
	Auto	The wireless client can associate with this access point by using any one of these two authentication types.
Fragment Threshold		“Fragment Threshold” specifies the maximum size of packet during the

	fragmentation of data to be transmitted. If you set this value too low, it will result in bad performance.
RTS Threshold	When the packet size is smaller than the RTS threshold, the access point will not use the RTS/CTS mechanism to send this packet.
Beacon Interval	The interval of time that this access point broadcast a beacon. Beacon is used to synchronize the wireless network.
Data Rate	The “Data Rate” is the rate this access point uses to transmit data packets. The access point will use the highest possible selected transmission rate to transmit the data packets.
Preamble Type	Preamble type defines the length of CRC block in the frames during the wireless communication. “Short Preamble” is suitable for high traffic wireless network. “Long Preamble” can provide more reliable communication.
Broadcast ESSID	If you enable “Broadcast ESSID”, every wireless station located within the coverage of this access point can discover this access point easily. If you are building a public wireless network, enabling this feature is recommended. Disabling “Broadcast ESSID” can provide better security.
IAPP	If you enable “IAPP”, the access point will automatically broadcast information of associated wireless stations to its neighbors. This will help wireless station roaming smoothly between access points. If you have more than one access points in your wireless LAN and wireless stations have roaming requirements, enabling this feature is recommended. Disabling “IAPP” can provide better security.
802.11g Protection	This is also called CTS Protection. It is recommended to enable the protection mechanism. This mechanism can decrease the rate of data collision between 802.11b and 802.11g wireless stations. When the protection mode is enabled, the throughput of the AP will be a little lower due to many of frame traffic should be transmitted.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.4 Security

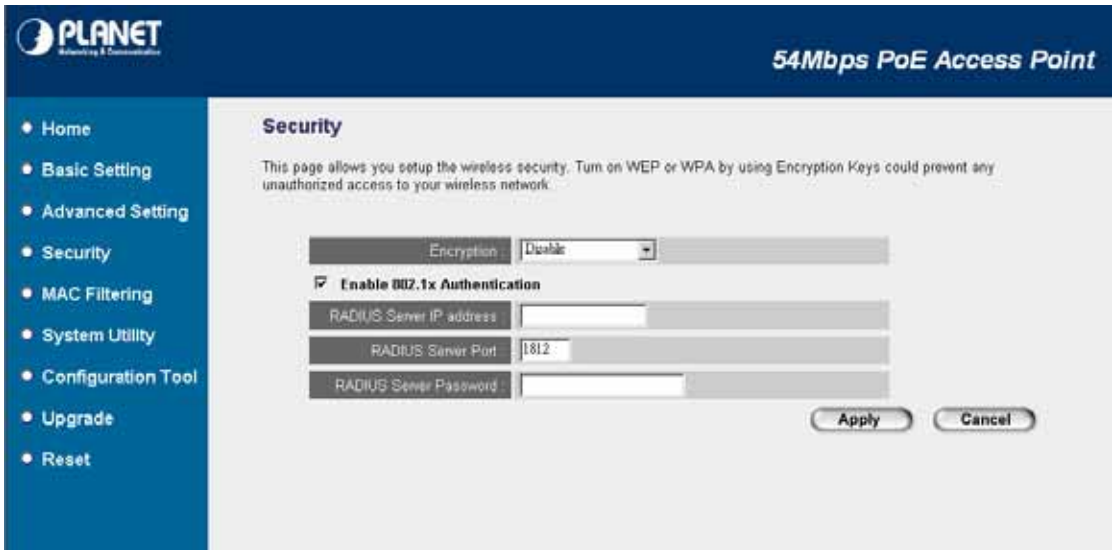
This Access Point provides complete wireless LAN security functions, includes WEP, 802.1x, 802.1x with WEP, WPA-PSK and WPA RADIUS. With these security functions, you can prevent your wireless LAN from illegal access. Please make sure your wireless stations use the same security function. In default, the security function is “Disable”.

Note: This access point can act as station and AP at the same time in “Universal Repeater

mode". The security settings only apply to AP function in "Universal Repeater mode". The station function of "Universal Repeater mode" does not have security feature.

3.4.1 802.1x

IEEE 802.1x is an authentication protocol. Every user must use a valid account to login to this Access Point before accessing the wireless LAN. The authentication is processed by a RADIUS server. This mode only authenticates user by IEEE 802.1x, but it does not encryption the data during communication. You can use 802.1x without encryption in "AP mode", "AP Bridge-WDS mode" and "Universal Repeater mode".



Parameter	Description
Encryption	This setting will be disable in default. When you would like to work with

	802.1x only, please keep this setting in “Disable”.
Enable 802.1x Authentication	Please check this option to enable 802.1x function.
RADIUS Server IP Address	Enter RADIUS Serer IP address.
RADIUS Server Port	Leave the default port setting or assign a new port number for this option.
RADIUS Server Password	Please enter the password that is assigned in RADIUS Server.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.4.2 WEP

When you select 64-bit or 128-bit WEP key, you have to enter WEP keys to encrypt data. You can generate the key by yourself and enter it. You can enter four WEP keys and select one of them as default key. Then the access point will just allow the clients that with the same encryption keys connected. You can use WEP encryption in “AP mode”, “Station-Ad Hoc mode”, “Station-Infrastructure mode”, “AP Bridge-WDS mode” and “Universal Repeater mode”.

If you would like to enable 802.1x Authentication also, please check the “Enable 802.1x Authentication” and refer to section 3.4.1 for the detail of 802.1x settings.

Parameter	Description
Encryption	Please select “WEP” in this option.
Key Length	You can select the 64 or 128-bit key to encrypt transmitted data. Larger

	WEP key length will provide higher level of security, but the throughput will be lower.
Key Format	You may select to select ASCII Characters (alphanumeric format) or Hexadecimal Digits (in the “A-F”, “a-f” and “0-9” range) to be the WEP Key. For example: ASCII Characters: guest Hexadecimal Digits: 12345abcde
Default Tx Key	Select one of the four keys to encrypt your data. Only the key you select it in the “Default key” will take effect.
Encryption Key 1 - Key 4	The WEP keys are used to encrypt data transmitted in the wireless network. Fill the text box by following the rules below. 64-bit WEP: input 10-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or 5-digit ASCII character as the encryption keys. 128-bit WEP: input 26-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or 10-digit ASCII characters as the encryption keys.
Enable 802.1x Authentication	Check this box when you would like to enable 802.1x authentication with WEP encryption. You may refer to section 3.4.1 to enter the correct setting of the fields.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.4.3 WPA pre-shared key

WiFi Protected Access (WPA) is an advanced security standard. You can use a pre-shared key to authenticate wireless stations and encrypt data during communication. It uses TKIP or CCMP (AES) to change the encryption key frequently. So the encryption key is not easy to be broken by hackers. This can improve security very much. You can use WPA pre-shared key encryption in “AP mode”, “Station-Ad Hoc mode”, “Station-Infrastructure mode”, “AP Bridge-WDS mode” and “Universal Repeater mode”.

Parameter		Description
Encryption		Please select “WPA pre-shared key” in this option.
WPA Unicast Cipher Suite	WPA (TKIP)	TKIP can change the encryption key frequently to enhance the wireless LAN security.
	WPA2 (AES)	This use CCMP protocol to change encryption key frequently. AES can provide high-level encryption to enhance the wireless LAN security.
	WPA2 Mixed	This will use TKIP or AES based on the other communication peer automatically.
Pre-shared Key Format		You may select to select Passphrase (alphanumeric format) or Hexadecimal Digits (in the “A-F”, “a-f” and “0-9” range) to be the Pre-shared Key. For example: Passphrase: iamguest Hexadecimal Digits: 12345abcde
Pre-shared Key		The Pre-shared key is used to authenticate and encrypt data transmitted in the wireless network. Fill the text box by following the rules below. Hex: input 64-digit Hex values (in the “A-F”, “a-f” and “0-9” range) or at least 8 character pass phrase as the pre-shared keys.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.4.4 WPA RADIUS

WiFi Protected Access (WPA) is an advanced security standard. You can use an external RADIUS server to authenticate wireless stations and provide the session key to encrypt data during communication. It uses TKIP or CCMP (AES) to change the encryption key frequently. This can improve security very much. You can use WPA RADIUS encryption in “AP mode”, “AP Bridge-WDS mode” and “Universal Repeater mode”.

Parameter		Description
Encryption		Please select “WPA pre-shared key” in this option.
WPA Unicast Cipher Suite	WPA (TKIP)	TKIP can change the encryption key frequently to enhance the wireless LAN security.
	WPA2 (AES)	This use CCMP protocol to change encryption key frequently. AES can provide high-level encryption to enhance the wireless LAN security.
	WPA2 Mixed	This will use TKIP or AES based on the other communication peer automatically.
RADIUS Server IP Address		Enter RADIUS Serer IP address.
RADIUS Server Port		Leave the default port setting or assign a new port number for this option.
RADIUS Server Password		Please enter the password that is assigned in RADIUS Server.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.5 MAC Filtering

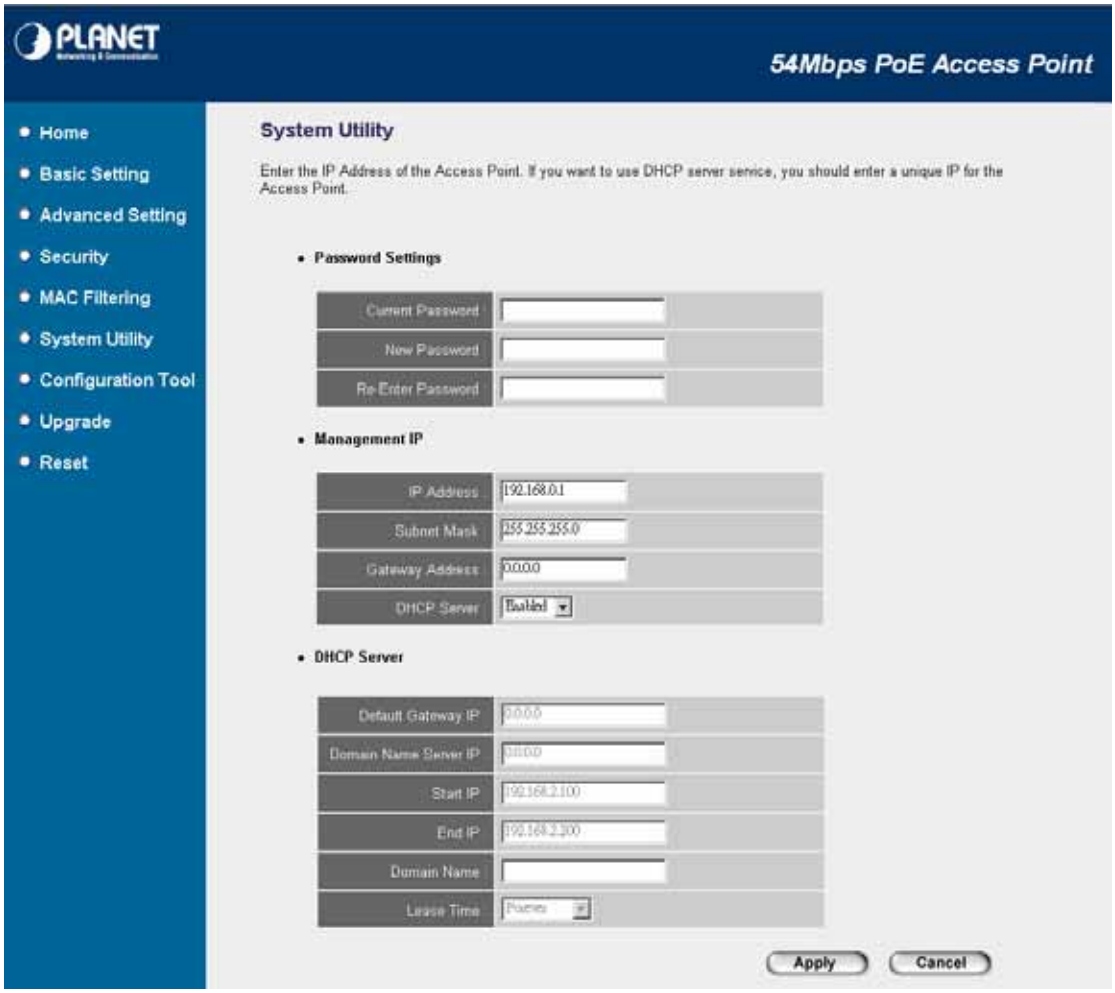
For security reason, the MAC Address Filtering that only allows authorized MAC Addresses associating to the Access Point.

Parameter	Description
Enable Wireless Access Control	Enable or disable the MAC Address Filtering function.
MAC Address Filtering Table	This table records the MAC addresses of wireless stations you allowed to access your network. The “Comment” field is the description of the wireless station associated with the “MAC Address” and is helpful for you to recognize the wireless station.
Add MAC address into the table	In the bottom “New” area, fill in the “MAC Address” and “Comment” of the wireless station to be added and then click “Add”. Then this wireless station will be added into the “MAC Address Filtering Table” above.
Remove MAC address from the table	If you want to remove some MAC address from the “MAC Address Filtering Table”, select the MAC addresses you want to remove in the table and then click “Delete Selected”. If you want to remove all MAC addresses from the table, just click “Delete All” button.
Reset	Click “Reset” will clear your current selections.

After configuration complete, please click “Apply” button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press “Continue” for configure other settings or “Apply” to restart WAP-4033PE with new configuration.

3.6 System Utility

From here, you can define the Access Point's IP Address and Login Password and enable the Access Point to be a DHCP Server.



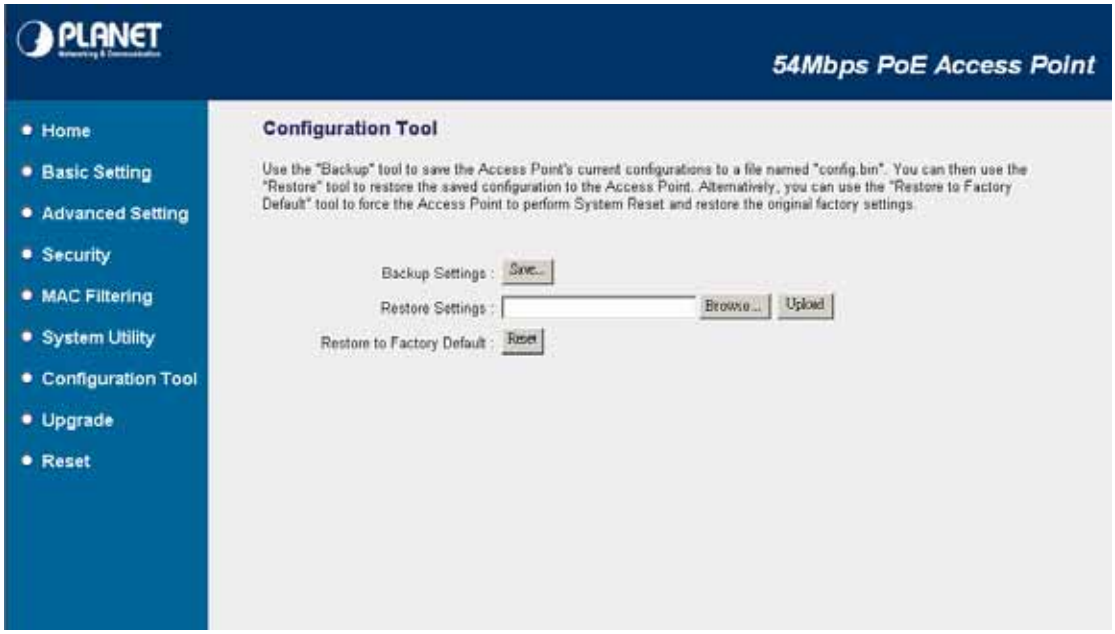
Parameter	Description
Password Settings	
Current Password	Enter the current password (up to 15-digit alphanumeric string) of the Access Point. The default password for WAP-4033PE is **admin**. Note that the password is case-sensitive.
New Password	Enter the password (up to 15-digit alphanumeric string) you want to login to the Access Point. Note that the password is case-sensitive.
Re-Enter Password	Reconfirm the password (up to 15-digit alphanumeric string) you want to login to the Access Point. Note that the password is case-sensitive.
Management IP	
IP Address	Designate the Access Point's IP Address. This IP Address should be unique in your network. The default IP Address is **192.168.0.1**.
Subnet Mask	Specify a Subnet Mask for your LAN segment. The default Subnet Mask of

	the Access Point is **255.255.255.0**.
Gateway Address	The IP address of the default gateway of the subnet that this access point resides in. It allows this access point be accessed by PC from deferent subnet to do configuration.
DHCP Server	Enable or disable the DHCP Server.
DHCP Server	
Default Gateway IP	Specify the gateway IP in your network. This IP address should be different from the Management IP.
Domain Name Server IP	This is the ISP's DNS server IP address that they gave you; or you can specify your own preferred DNS server IP address.
Start IP/End IP	You can designate a particular IP address range for your DHCP server to issue IP addresses to your LAN Clients. By default the IP range is from: Start IP **192.168.0.100** to End IP **192.168.0.200**.
Domain Name	You can specify the Domain Name for your Access Point.
Lease Time	The DHCP Server when enabled will temporarily give your LAN client an IP address. In the Lease Time setting you can specify the time period that the DHCP Server lends an IP address to your LAN clients. The DHCP Server will change your LAN client's IP address when this time threshold period is reached.

After configuration complete, please click "Apply" button to save the configuration. Then you will see a screen to prompt you the settings are save successfully. You may press "Continue" for configure other settings or "Apply" to restart WAP-4033PE with new configuration.

3.7 Configuration Tool

The Configuration Tools screen allows you to save (**Backup**) the WAP-4033PE current settings. Saving settings provides an added protection and convenience should problems occur with the Access Point and you have to reset to factory default. When you save the configuration setting (Backup) you can re-load the saved configuration into the WAP-4033PE through the **Restore** selection. If extreme problems occur you can use the **Restore to Factory Default** selection, this will set all configurations to original default settings (e.g. when you first purchased the Access Point).



Parameter	Description
Configuration Tools	Use the "**Backup**" tool to save the Access Point's current configuration to a file named "config.bin" on your PC. You can then use the "**Restore**" tool to upload and restore the saved configuration to the Access Point. Alternatively, you can use the "**Restore to Factory Default**" tool to force the Access Point to perform a power reset and restore the original factory settings.

3.8 Upgrade

This page allows you to upgrade WAP-4033PE with latest firmware.

Parameter	Description
Firmware Upgrade	This tool allows you to upgrade the Access Point's system firmware. To upgrade the firmware of WAP-4033PE, you need to download the firmware file to your local hard disk, and enter that file name and path in the appropriate field on this page. You can also use the "**Browse…**" button to find out the firmware file on your PC. Please press Apply button to upgrade and reset WAP-4033PE. When the upgrade process is complete. We will suggest you power off/on WAP-4033PE to make the new firmware effect.

3.9 Reset

You can reset the WAP-4033PE system when it works incorrect. The reset function essentially Re-boots your WAP-4033PE system.

Parameter	Description
Reset	In the event that the system stops responding correctly or in some way stops functioning, you can perform a reset. **Your settings will not be changed by reset procedure**. To perform the reset, click on the **Apply** button. You will be asked to confirm your decision. Once the reset process is complete you may start using the Access Point again.

Chapter 4 Specification

Standard	IEEE 802.11g / 802.11b
Frequency Band	2.400~2.4835GHz
Transfer Rate	802.11g: 54/48/36/24/18/12/9/6Mbps 802.11b: 11/5.5/2/1Mbps
Modulation	OFDM, CCK, DQPSK and DBPSK
Sensitivity	**11g @ PER < 10%** 54Mbps: -71.46 dBm 48Mbps: -73.1 dBm 36Mbps: -75 dBm 24Mbps: -77 dBm 18Mbps: -79.1 dBm 12Mbps: -81.1 dBm 9Mbps: -83.5 dBm 6Mbps: -85.52 dBm **11b @ PER < 8%** 11Mbps: -82 dBm 5.5Mbps: -85.7dBm 2Mbps: -87 dBm 1Mbps: -91.5 dBm
Channel	FCC: 11 Channels (US, Canada) ETSI: 13 Channels (Europe) ELEC: 14 Channels (Japan)
Radio Technology	Direct Sequence Spread Spectrum (DSSS)
Antenna	Detachable dipole antenna
Transmit Power	18dBm (max.)
LAN Interface	1-port RJ-45 UTP, Auto-MDI/MDI-X
Cabling	Category 5/5e or above, 4-pair
LED Indicators	3; PWR, WLAN, LAN
Power	12V DC, 500mA, PoE (IEEE802.3af compliant)
Temperature	0 ~ 55°C (Operating)
Humidity	10 ~ 90%, non-condensing (Operating)
Dimension	154 x 88 x 32 (mm)
Weight	180g
Emission	FCC Class B, CE-mark

Chapter 5 Frequently Ask Question

This chapter provides answer to problems usually encountered during the *installation* and operation of the *Wireless Network Access Point*. Read the description below to solve your problems.

Q. Can I run an application from a remote computer over the wireless network?

A. This will depend on whether or not the application is designed to be used over a network. Consult the application's user guide to determine if it supports operation over a network.

Q. Can I play games with other members of the cordless network?

A. Yes, as long as the game supports multiple plays over a LAN (local area network). Refer to the game's user guide for more information.

Q. What is the IEEE 802.11g standard?

A. The IEEE 802.11g Wireless LAN standards subcommittee, which is formulating a standard for the industry. The objective is to enable wireless LAN hardware from different manufactures to communicate.

Q. What IEEE 802.11 features are supported?

A. The product supports the following IEEE 802.11 functions:

- CSMA/CA plus Acknowledge protocol
- Multi-Channel Roaming
- Automatic Rate Selection
- RTS/CTS feature
- Fragmentation
- Power Management

Q. What is Infrastructure?

A. An integrated wireless and wired LAN is called an Infrastructure configuration. Infrastructure is applicable to enterprise scale for wireless access to central database, or wireless application for mobile workers.

Q. What is Roaming?

A. Roaming is the ability of a portable computer user to communicate continuously while moving freely throughout an area greater than that covered by a single Wireless Network Access Point. Before using the roaming function, the workstation must make sure that it is the same channel number with the Wireless Network Access Point of dedicated coverage area.

Q. When WAP-4033PE works with WDS mode, can wireless connect to it?

A. Yes, WDS mode is work as a AP and Bridge at the same time. So the wireless client can access to WDS mode WAP-4033PE without problem. When wireless client connect to the remote site via WDS mode, the performance will be 50% then access to the connected WDS mode WAP-4033PE. Just like connect to AP via a repeater.

Q. How much wired client can connect to Station mode WAP-4033PE?

A. We will suggest you connect max. 5 wired clients to a WAP-4033PE. This more is not suit to connect a large wired network. If you have much more clients has to connected via wireless, please set WAP-4033PE to Bridge mode. Bridge mode will be suit to connect wired LANs together.

Q. Is WAP-4033PE Bridge mode compatible with other bridge mode device?

A. Yes. WAP-4033PE Bridge mode is compatible with WAP-4033 / WAP-4035 and WRT-414. They are designed with the same chipset. So their bridge mode is compatible to each other.

Q. When I set WAP-4033PE to Universal Repeater mode, the PCs that connect to WAP-4033PE LAN port can not access to wireless network. Why?

A. Since Repeater is use to extend the AP's coverage only, so the PC connect to Repeater LAN port will be configure repeater only. It can not connect to wireless network.